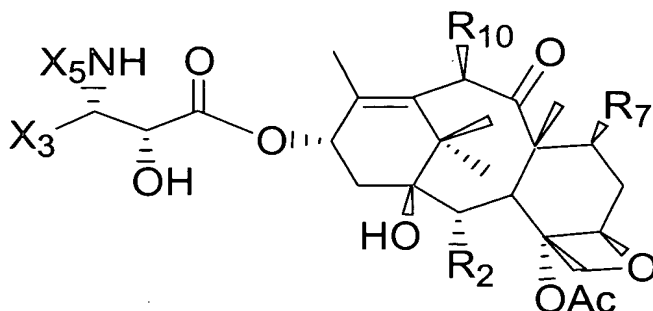


Claims

1. A method of inhibiting tumor growth in a mammal, said method comprising orally administering a therapeutically effective amount of a composition comprising at least one pharmaceutically acceptable carrier and a taxane having the formula

5



wherein

X_3 is isopropyl, isobutenyl, cyclopropyl, cyclobutyl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyridyl, 3-pyridyl, 4-pyridyl or p-nitrophenyl;

X_5 is $-\text{COX}_{10}$ and X_{10} is 2-furyl, 2-thienyl, 3-pyridyl, 4-pyridyl, n-propyl, 10 butenyl or isobutenyl;

R_2 is benzoyloxy;

R_7 is hydroxy;

R_{10} is $R_{10a}\text{OCOO}-$; and

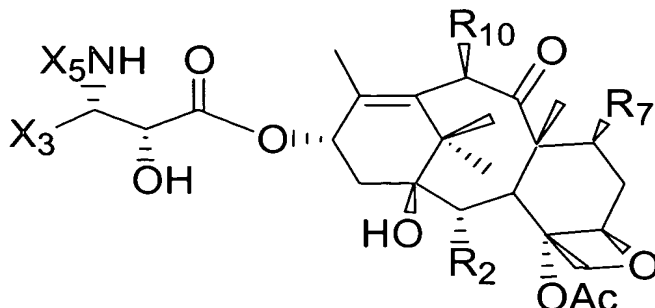
R_{10a} is methyl or ethyl.

2. The method of claim 1 wherein X_3 is 2-thienyl or 3-thienyl.

3. The method of claim 1 wherein X_3 is 2-furyl or 3-furyl.

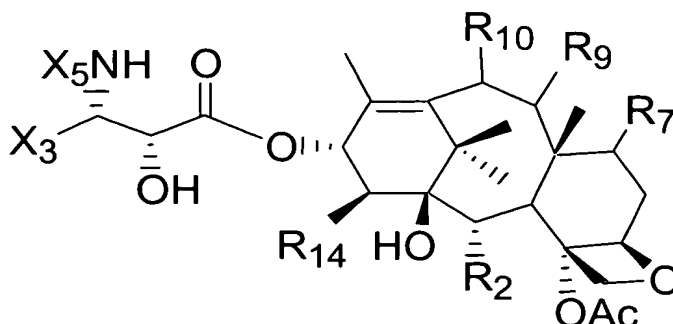
4. A method of inhibiting tumor growth in a mammal, said method comprising orally administering a therapeutically effective amount of a composition comprising at least one pharmaceutically acceptable carrier and a taxane having the formula

5



wherein

- X_3 is 2-furyl, 3-furyl or 2-thienyl or 3-thienyl;
 X_5 is $-\text{COX}_{10}$ and X_{10} is trans-propenyl or isopropyl;
 R_2 is benzoyloxy;
 R_7 is hydroxy;
 R_{10} is $R_{10a}\text{OCOO}-$; and
 R_{10a} is methyl or ethyl.
- 10
5. The method of claim 4 wherein X_3 is 2-furyl or 3-furyl.
6. The method of claim 4 wherein X_3 is 2-thienyl or 3-thienyl.
7. The method of claim 4 wherein R_{10a} is ethyl.
8. The method of claim 7 wherein X_3 is 2-furyl or 3-furyl.
9. The method of claim 7 wherein X_3 is 2-thienyl or 3-thienyl.
10. The method of claim 4 wherein X_5 is $-\text{COX}_{10}$ and X_{10} is trans-propenyl.
11. A method for preparing a pharmaceutical composition comprising mixing at least one nonaqueous, pharmaceutically acceptable solvent and a taxane having the formula



wherein

- 5 R_2 is acyloxy;
 R_7 is hydroxy;
 R_9 is keto, hydroxy, or acyloxy;
 R_{10} is carbonate;
 R_{14} is hydrido or hydroxy;
10 X_3 is heterocyclo;
 X_5 is $-COX_{10}$, $-COOX_{10}$, or $-CONHX_{10}$;
 X_{10} is hydrocarbyl, substituted hydrocarbyl, or heterocyclo; and
 Ac is acetyl.

12. The method of claim 11 wherein X_3 is 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl or 4-pyridyl.

13. The method of claim 11 wherein R_{10} is $R_{10a}OCOO^-$ and R_{10a} is methyl or ethyl.

14. The method of claim 11 wherein X_5 is $-COX_{10}$ and X_{10} is substituted or unsubstituted phenyl, 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, $C_1 - C_8$ alkyl, $C_2 - C_8$ alkenyl, or $C_2 - C_8$ alkynyl, or X_5 is $-COOX_{10}$ and X_{10} is substituted or unsubstituted $C_1 - C_8$ alkyl, $C_2 - C_8$ alkenyl, or $C_2 - C_8$ alkynyl.

15. The method of claim 11 wherein X_3 is 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl or 4-pyridyl, R_{10} is $R_{10a}OCOO^-$ and R_{10a} is methyl or ethyl.

16. The method of claim 11 wherein X_3 is 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl or 4-pyridyl, X_5 is $-COX_{10}$ and X_{10} is substituted or

unsubstituted phenyl, 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, C₁ - C₈ alkyl, C₂ - C₈ alkenyl, or C₂ - C₈ alkynyl, or X₅ is -COOX₁₀ and X₁₀ is substituted or unsubstituted C₁ - C₈ alkyl, C₂ - C₈ alkenyl, or C₂ - C₈ alkynyl.

17. The method of claim 11 wherein R₁₀ is R_{10a}OCOO- and R_{10a} is methyl or ethyl, X₅ is -COX₁₀ and X₁₀ is substituted or unsubstituted phenyl, 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, C₁ - C₈ alkyl, C₂ - C₈ alkenyl, or C₂ - C₈ alkynyl, or X₅ is -COOX₁₀ and X₁₀ is substituted or unsubstituted C₁ - C₈ alkyl, C₂ - C₈ alkenyl, or C₂ - C₈ alkynyl.

18. The method of claim 11 wherein X₃ is 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl or 4-pyridyl, R₁₀ is R_{10a}OCOO-, R_{10a} is methyl or ethyl, X₅ is -COX₁₀ and X₁₀ is substituted or unsubstituted phenyl, 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, C₁ - C₈ alkyl, C₂ - C₈ alkenyl, or C₂ - C₈ alkynyl, or X₅ is -COOX₁₀ and X₁₀ is substituted or unsubstituted C₁ - C₈ alkyl, C₂ - C₈ alkenyl, or C₂ - C₈ alkynyl.

19. The method of claim 11 wherein X₃ is 2-furyl or 3-furyl.

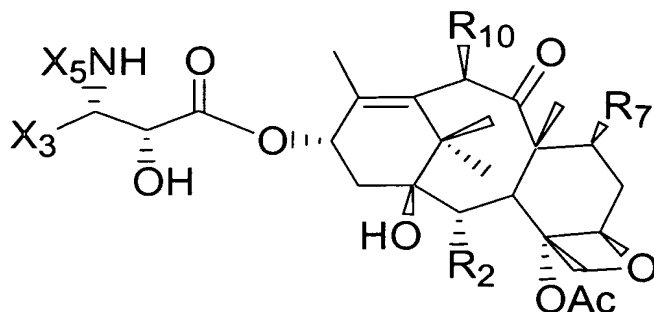
20. The method of claim 11 wherein X₃ is 2-thienyl or 3-thienyl.

21. The method of claim 13 wherein X₃ is 2-furyl, 3-furyl, 2-thienyl or 3-thienyl.

22. The method of claim 14 wherein X₃ is 2-furyl, 3-furyl, 2-thienyl or 3-thienyl.

23. The method of claim 18 wherein X₃ is 2-furyl, 3-furyl, 2-thienyl or 3-thienyl.

24. A taxane having the formula



wherein

X₃ is isopropyl, isobutenyl, cyclopropyl, cyclobutyl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyridyl, 3-pyridyl, 4-pyridyl or p-nitrophenyl;

X₅ is -COX₁₀ and X₁₀ is 2-furyl, 2-thienyl, 3-pyridyl, 4-pyridyl, n-propyl, butenyl or isobutenyl;

R₂ is benzoyloxy;

R₇ is hydroxy;

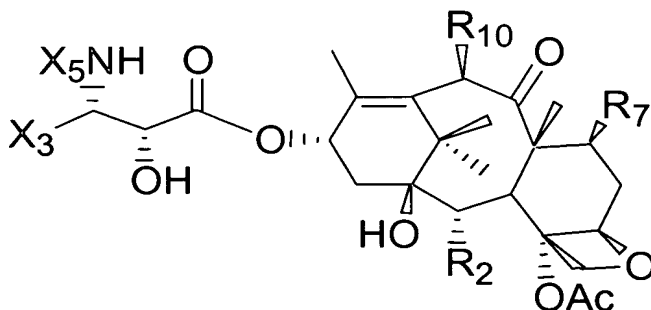
R₁₀ is R_{10a}OCOO-; and

R_{10a} is methyl or ethyl.

25. The taxane of claim 24 wherein X₃ is 2-thienyl or 3-thienyl.

26. The taxane of claim 24 wherein X₃ is 2-furyl or 3-furyl.

27. A taxane having the formula



wherein

X₃ is 2-furyl, 3-furyl or 2-thienyl or 3-thienyl;

X₅ is -COX₁₀ and X₁₀ is trans-propenyl or isopropyl;

R_2 is benzoyloxy;
 R_7 is hydroxy;
 R_{10} is $R_{10a}OCOO-$; and
 R_{10a} is methyl or ethyl.

28. The taxane of claim 27 wherein X_3 is 2-furyl or 3-furyl.
29. The taxane of claim 27 wherein X_3 is 2-thienyl or 3-thienyl.
30. The taxane of claim 27 wherein R_{10a} is ethyl.
31. The taxane of claim 27 wherein X_5 is $-COX_{10}$ and X_{10} is trans-propenyl.
32. The taxane of claim 30 wherein X_3 is 2-furyl or 3-furyl.
33. The taxane of claim 30 wherein X_3 is 2-thienyl or 3-thienyl.